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ABSTRACT

Empathy, a basis for altruistic motivation, is viewed as a developmental process by Hoffman and others. Current measures of empathy, such as the Davis Interpersonal Reactivity Index (IRI), have been analyzed by exploratory factor analytic methods which do not allow for the testing of a developmental model of the simplex form. This study was conducted to test Hoffman's theoretical formulations of empathy. Data from the responses of 679 college students to the four subscales of the Davis IRI (personal distress, empathic concern, perspective taking, and fantasy) were analyzed by multidimensional scaling techniques (ALSCAL). Results indicated that a two-dimensional solution provides the best model. The first dimension supports a simplex model of Hoffman's theory with three of the four Davis subscales; the inclusion of the second dimension in the structure of empathy is questioned. It was found that fantasy clusters separately from the other components and thus may not belong in definitions of empathy. (Author)

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The Structure of Empathy:
A Multidimensional Scaling Approach

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Running head: STRUCTURE OF EMPATHY BY MULTIDIMENSIONAL SCALING

Abstract

Empathy, a basis for altruistic motivation, is viewed as a developmental process by Hoffman and others. Current measures of empathy, such as the Davis Interpersonal Reactivity Index, have been analyzed by exploratory factor analytic methods which do not allow for the testing of a developmental model of the simplex form. This study was conducted to test Hoffman's theoretical formulations of empathy. Data from the responses of 679 college students to the four subscales of the Davis IRI (personal distress, empathic concern, perspective taking, and fantasy) were analyzed by multidimensional scaling techniques (ALSCAL). Results indicated that a two-dimensional solution provides the best model. The first dimension supports a simplex model of Hoffman's theory with three of the four Davis subscales; the inclusion of the second dimension in the structure of empathy is questioned. It was found that fantasy clusters separately from the other components and thus may not belong in definitions of empathy.

The Structure of Empathy:

A Multidimensional Scaling Approach

Much socio-psychological research has investigated the role of empathy in helping behavior and concludes that empathy is an important motivator of helping (Krebs, 1975). While there is consensus on the importance of empathy as a mediator, there is less agreement about the nature of the construct. This article is intended to provide some evidence for a theoretical structure for empathy — a structure that accounts for both the emotional and cognitive aspects.

Batson and Coke (1981) and others suggest that viewing another person's distress tends to produce some physiological arousal in the observer. If this arousal is cognitively labeled as concern for the distressed person, the observer will experience empathy. And this empathy will most likely lead to motivation to see the distress in the other person reduced. This view focuses on the emotional or arousing side of empathy and, indeed, Batson and Coke define empathy as "an emotional response elicited by and congruent with the perceived welfare of someone else." Other investigators, however, have emphasized the cognitive side of empathy reflecting the influence of Piaget (1965). Their work focuses on the accuracy of perceiving the position or plight of others. The cognitive viewpoint has guided the attention paid to empathy in counseling settings: counselors are trained to experience clients' feelings as their own but in a cognitive way.

Becoming distressed emotionally is considered by many to be detrimental to the counseling process.

Recently, empathy has received considerable attention with the revival of the altruism versus egoism controversy of helping behavior. Is the motivation to help altruistic or egoistic? In other words, is the helping act directed toward the goal of increasing the other person's welfare (i.e., altruistic motivation) or is it primarily directed toward the goal of increasing the helper's own welfare by decreasing the distress caused by viewing another's plight (i.e., egoistic motivation)? Experimental work in the area is scant because it is difficult to measure validly subjects' motivation to help.

Batson, Duncan, Ackerman, Buckley, and Birch (1981) solved this problem creatively. They orthogonally manipulated empathy (high versus low) and ease of escape from helping (easy versus difficult). They reasoned, on the one hand, that if empathy leads to egoistic motivation, potential helpers should be more ready to help when escape is difficult than when it is easy. This is because these subjects would be concerned primarily with reducing their own distress at minimal personal cost. Therefore, they would escape when it was easy but they would help when escape was difficult. On the other hand, if empathy leads to altruistic motivation, potential helpers should be as ready to help when escaping is easy as when it is difficult because they are motivated primarily to alleviate the victim's distress. Batson et

al.'s experiments have supported the hypothesis that empathy leads to altruistic rather than egoistic motivation to help. However, their statistical designs were biased in favor of altruism in that support for that hypothesis was based upon failure to reject the null hypothesis.

Empathy as a basis for altruistic motivation can be viewed as a developmental process. Hoffman (1975) has constructed a theory of the development of altruism based on cognitive development and mechanisms for empathic distress that are present from birth. He contends that infants react to another infant's cry with behaviors indicating that they themselves are personally distressed. As cognitive capabilities develop, they operate together with this affective distress to form the basis for altruistic motivation. Specifically, as young children learn to discriminate between their own bodies and those of others, they learn that it is others, not themselves, who are in pain or distress. The earlier personal distress is gradually transformed into a more sympathetic or empathic concern for the victim.

Further cognitive development enables the child to become aware that others have independent inner states. The observing child becomes able to take the perspective of the other and realize that the other may not feel the same way in a situation as she or he does. Individuals develop cognitievly to the point that they can have a mental representation of the other's opportunities, chronic situation, etc. If this representation

falls short of what the observer feels to be a minimally acceptable standard of well-being, the individual may respond with a sympathetic or altruistic response.

A developmental or stage model such as Hoffman described implies a structure that resembles a simplex (Guttman, 1954). Each stage in the model consists of characteristics of the previous stage plus some newly emerging insights into the other's distress. A general personal distress develops into an empathic reaction of concern for the victim which, in turn, develops into a mature ability to take the perspective of a troubled other. The components of empathy are viewed as linearly ordered in this special way along one underlying developmental dimension.

Davis (1980) argues that empathy is a multidimensional construct consisting of four aspects: fantasy, personal distress, perspective taking, and empathic concern. Using exploratory factor analytic techniques, he developed the Interpersonal Reactivity Index (IRI) to tap the different dimensions of empathy; each is measured by a seven-item subscale. The fantasy (F) scale measures individuals' tendency to "transpose themselves imaginatively into the feelings and actions of fictitious characters in books, movies, and plays" (p. 114, Davis, 1983). Davis' perspective-taking (PT) scale measures persons' tendencies to experience cognitively the point of view of others. Two other subscales attempt to tap the more emotional side of empathy; empathic concern (EC) items assess concern and sympathy for others

who are having difficulties, and personal distress (PD) taps individuals' tendency to respond to others' misfortune with anxiety and tenseness.

Davis' work was based on traditional factor analytic methods. That approach serves to define a set of latent variables which together account reasonably well for the covariation among a set of measures. The structure among the component, latent variables in a factor analysis is typically arbitrary -- it is one among many that account equally well for the inter-measure covariation. The contribution that Davis has made to the understanding of empathy has been in his isolation of its components and not to the manner in which they combine to produce their effect.

Although a simplex structure, such as that implied by Hoffman's developmental theory of empathy, can be represented in factor analytic terms (Guttman, 1955; Jöreskog, 1978), confirmatory (vs. exploratory) factor analysis is not an optimal method in the present instance because of the possibility that the hypothesized structure might co-exist within the data with other systematic structural parts. An exploratory analysis is appropriate. However, the analysis must permit the detection of the simplex structure even if it is partially obscured by other systematic effects. Multidimensional scaling meets these criteria, and it was adopted for the present study to generate a model of empathy.

The items of the Davis Interpersonal Reactivity Index were

intercorrelated and subjected to a multidimensional scaling analysis. At issue was whether these data provide support for Hoffman's developmental model of empathy. Specifically, we wanted to determine if the configuration of items produced by a scaling solution would be a one-dimensional representation of the unfolding of the stages of empathy from infancy to adulthood. Of secondary interest was whether any other structural relationships among the items might be suggested.

Method

Subjects

Subjects were 679 male and female undergraduate students enrolled in introductory psychology classes at the University of Illinois at Chicago; all were volunteers for this particular experiment who participated in exchange for course credit.

Materials and Procedure

All subjects completed the four subscales of the Davis Interpersonal Reactivity Index using a five-point response scale ranging from 0, "does not describe me well," to 4, "describes me well." Each of the subscales has seven items. A sample item from perspective taking (PT) which measures the cognitive tendency to experience others' point of view, is: "I try to look at everybody's side of a disagreement before I make a decision." A sample item for the empathic concern subscale (EC) which measures concern for others in distress, is: "I often have tender, concerned feelings for people less fortunate than me." An item

from the fantasy subscale (F) which measures the tendency to experience, both cognitively and affectively, the role of fictional characters, is: "After seeing a play or movie, I have felt as though I were one of the characters." And lastly, an item from the personal distress subscale (PD), which measures discomfort at another's misfortune, is: "When I see someone who badly needs help in an emergency, I go to pieces." Davis reports that the emergent factors underlying his scale are the same for both males and females and were found in two independent college samples. The standardized alpha coefficients for the four subscales range from .68 to .79.

The goal of deriving a model of empathy and comparing it to Hoffman's developmental model was achieved by an MDS analysis of the similarity of responses to items of the Davis IRI. Similarity was assessed by the intercorrelations of the items. The inter-item correlation matrix was analyzed by the MDS program ALSCAL (Alternating Least Squares Scaling) (Takane, Young, and de Leeuw, 1977). Solutions were computed for one, two, and three dimensions and were evaluated in terms of two criteria: the amount of variance accounted for by that solution and the clarity of interpretation of the results.

Results

Three ALSCAL models were fitted to the similarities data with the results in Table 1. Although the three-dimensional solution provided a good fit to the data, as indicated by the stress value

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Insert Table 1 about here

(.126), it added to R^2, the variance accounted for, by only about 4%. Furthermore, the arrangement of the items on the third dimension was not obviously interpretable in terms of the Davis components. For these reasons, the two-dimensional model was preferred.

The two-dimensional solution appears to give a good fit and lends itself readily to interpretation (see Figure 1). The first dimension, which accounts for most of the variance, appears to support Hoffman's model in that the three components (personal distress, empathic concern, and perspective taking) are ordered along it according to the developmental sequence that he described. Fantasy items on this dimension overlap substantially with empathic concern. However, fantasy is clearly differentiated from the other three empathy components on the second dimension. Thus, the subscales that Davis identified appear to fall along a single dimension in a simplex-like structure. Additionally, his fantasy subscale appears to tap a process that is qualitatively different from those that underly the other subscales.

Discussion and Conclusion

It is perhaps noteworthy that in our analyses the various items clustered as expected according to the factors that Davis

isolated. This finding provides cross-validation evidence for Davis' work, and, at the same time, indicates that the Davis scale is appropriate for the participants in the present study.

The two major results of the present analysis are strong support for Hoffman's developmental theory of empathy, and evidence that fantasy empathy is qualitatively different from other forms. The first, and primary, dimension in the analysis ordered three of the Davis subscales precisely as predicted from Hoffman's work. This simple ordering on a single dimension is what is expected when the processes that underly a psychological function at one stage include those of earlier stages in addition to a novel component.

The implications of the present results for understanding fantasy empathy are unclear. The analysis suggests that this component matures at about the same time as empathic concern, but it is distinguishable from that component on the second dimension (which appears to reflect reality versus unreality). The pattern of results suggests that the fantasy stage is not a necessary precursor of perspective-taking, the ultimate stage of empathy in the Hoffman theory.

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Author Notes

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Table 1

Stress and Fit Values for One, Two, and Three Dimensional Solutions

Number of Dimensions	Stress	Goodness-of-Fit (Kruskal, 1964)	R^2
One	.282	Poor-to-fair	.776
Two	.171	Fair-to-good	.863
Three	.126	Good	.901

FIGURE 1

Two – Dimensional ALSCAL Model
Derived Stimulus Configuration:
Dimension 1 (Horizontal) vs. Dimension 2 (Vertical)